CSX: Coherent Soft X-ray Scattering / full polarization control beamline

Scientific scope

The CSX beamline design (source and optics) has been optimized to the NSLS-II parameters to provide the highest possible flux for experiments requiring either high coherence or full control of the polarization.

Beamline description

The CSX beamline will be served by two identical EPU49 sources. Both EPUs are planned to operate in a canted geometry with opposite circular polarization for fast polarization switching experiments at the full polarization control (PC) branch. The EPUs will also be able to operate "phased" as a single device for high coherent flux experiments at the high coherent flux (HCF) branch. A third operation mode is planned where both branches are served simultaneously by one EPU.

Techniques

- Polarization dependent spectroscopy / scattering
- Ultrafast dynamics
- Coherent x-ray scattering / x-ray diffraction microscopy
- X-ray photon correlation spectroscopy

Beamline Performance

Source	Dual - EPU49
Energy range (eV)	270 - 2000
Wavelength range (nm)	4.6 - 0.6
Energy resolution @ 0.5keV (HCF)	$\Delta E/E = 1.5 \times 10^{-3}$
Energy resolution @ 0.5keV (PC)	$\Delta E/E = 1.0 \times 10^{-4}$
Beam size at sample (HCF) vxh (μm^2)	20 x 20
Beam size at sample (PC) v x h	10 x 50 / 5 x 5 *
Coherent flux @ 0.5 keV (HCF)	2.0×10^{13}
Flux @ 0.5 keV (PC) (ph/s/0.1% bw)	2.0×10^{1}

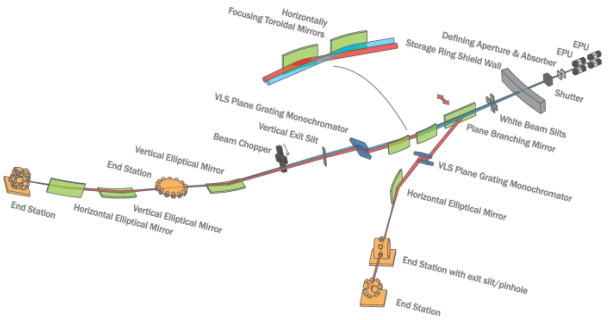
Equipment in End Stations

HCF experimental end station under commissioning
PC experimental end station under construction

Sample environments	**HCF**	**PC**
He cryostat	10 – 300 K	10 – 300 K
Magnetic field		1 Tesla (xyz)
Vacuum	10^{-9} Torr	10^{-8} Torr

Detectors

APD	planned	
Area detector	CCD (p)	planned
Channeltron	available	available
Photodiode	available	available



Schematic layout of the beamline

Conceptual Design Report

Current status:	preliminary design
Construction on the floor:	date pending
Commissioning with beam:	begins June 2014
General user operation:	begins June 2015

Signing of agreement between NSLS-II Project Director Steve Dierker and the Beamline Advisory Team, January 8, 2009. From left: (front row) Qun Shen, Steve Dierker, Cecilia Sánchez-Hanke (CSX group leader), and Steve Hulbert (BAT); (back row) Andy Broadbent, Ruben Reininger, John Hill, Dario Arena (BAT), Stuart Wilkins (BAT), and Paul Steadman (Diamond, visitor).

Contact

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